



उत्पाद मानुयल
व्यक्तिगत फॉल एरेस्ट प्रणाली – विशिष्ट
भाग 3 स्वतः खिचाव वाली लाईफलाइन्स
IS 3521 (Part 3) : 2021 के अनुसार

PRODUCT MANUAL FOR
PERSONAL FALL ARREST SYSTEM
PART 3: SELF RETRACTING LIFELINES
ACCORDING TO IS 3521 (PART 3) : 2021

भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम की स्कीम-I के तहत यह उत्पाद मानुयल प्रमाणीकरण के प्रचलन में रीति और पारदर्शिता के सुसंगत सुनिश्चित करने के लिए सभी क्षेत्रीय/शाखा कार्यालयों एवं लाइसेन्स धारियों द्वारा संदर्भ सामग्री के रूप में उपयोग किया जाएगा। बीआईएस लाइसेन्स/प्रमाण पत्र प्राप्त करने के इच्छुक भावी आवेदकों द्वारा भी इस दस्तावेज़ का उपयोग किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

1.	उत्पाद Product	:	IS 3521 (Part 3) : 2021
	शीर्षक Title	:	व्यक्तिगत फॉल एरेस्ट प्रणाली — विशिष्ट भाग 3 स्वतः खिचाव वाली लाईफलाइन्स Personal fall arrest systems —Specification Part 3 self-retracting lifelines
	संशोधनों की संख्या No. of Amendments	:	0 Nil
2.	नमूनाकरण दिशा निर्देश Sampling Guidelines:		
a)	कच्चा माल Raw material	:	कृपया Annex-A देखें Please refer ANNEX-A

b)	समूहीकरण दिशानिर्देश Grouping guidelines	:	कृपया Annex-B देखें Please refer ANNEX-B
c)	नमूने का परिमाण Sample Size	:	12 Nos. of Self Retractable lifelines of each Variety 14 Nos. for Self-Retractable Lifeline having Integral Rescue Facility for each variety
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	कृपया Annex-C देखें Please refer ANNEX –C
4.	निरीक्षण व परीक्षण स्कीम Scheme of Inspection and Testing	:	कृपया Annex-D देखें Please refer ANNEX –D
5.	एक दिन में संभावित परीक्षण Possible tests in a day :	:	Since testing facility is not available in any BIS/BIS recognized lab, complete testing has to be carried out in the Factory for certification and during surveillance. 3 days inspection required for complete testing
6.	लाइसेन्स का कार्यक्षेत्र / Scope of the Licence		
	IS 3521 (Part 3) : 2021 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है Licence is granted to use Standard Mark as per IS 3521 (Part 3) :2021 with the following scope:		
	Name of the product	Personal fall arrest systems - Part 3 Self-Retracting Lifelines	
	Type	SRL With/Without Integral Energy Absorber SRL With Integral Rescue Facility with Lifting/ Lifting & lowering Facility, With/Without Energy Absorber	
	Lifeline Component	Wire Rope/ Webbing/ 3 Strand Polyamide rope/ 3 Strand Polyester Rope / Braided Rope	
	Permitted for use	With/ Without Tripod	

ANNEX A

Raw Materials

1. Fibre ropes, webbing and sewing threads for lifelines shall be made from virgin high-tenacity filament or multifilament synthetic fibre or fibres suitable for the intended use.
2. Three Strand Polyamide Rope Shall Comply with IS 4572 & Three Strand Polyester Ropes shall Comply with IS 11066.
3. If Braided Rope is used in lifelines, it shall comply with EN 892 (Single Rope) or EN 1891 Type A Requirements. Any Equivalent Material is acceptable.
4. The minimum breaking force of fibre rope or webbing material used in the construction of lifelines shall be 22 kN.
5. The minimum diameter of wire rope material used in the construction of lifelines shall be 5 mm with a minimum breaking force of 15 kN.
6. The end of the lifeline which is intended for connection to the user's full-body harness shall be terminated with a swivel connector which complies with IS 3521(part 5).
7. The Metal Components used as a raw Material in Lifeline shall complies to Corrosion Resistance Test as per ISO 9227.

ANNEX-B

GROUPING GUIDELINES
PERSONAL FALL ARREST SYSTEM PART 3 SELF RETRACTING LIFELINES
ACCORDING TO IS 3521 (PART 3) : 2021

Following grouping guidelines shall apply while defining the scope of the licence in case of application for grant of licence or application for change in scope of licence

1. If Retractable lifeline with Integral Rescue Facility is Tested, SRL without Integral Rescue Facility may also be covered.
2. If Retractable Lifeline with Integral Rescue Facility having provision of Lifting & Lowering is tested, SRL with integral rescue facility with provision of lifting only may also be covered.
3. If Retractable lifeline with Integral Energy Absorber is tested, SRL without integral energy absorber may also be covered.

However, it shall be ensured that the firm has the requisite manufacturing and testing facilities to produce the varieties intended to be covered in the scope of licence. During operation of licence, samples of all varieties shall be drawn and tested by rotation.

ANNEX C

**LIST OF TEST EQUIPMENTS
PERSONAL FALL ARREST SYSTEM PART 3 SELF RETRACTING LIFELINES
ACCORDING TO IS 3521 (PART 3) : 2021**

Major test equipment required to test as per the Indian Standard

Sr. No.	Test Equipment	Tests used in with Clause Reference
1	• Salt Spray Chamber as per ISO 9227, • Ph Meter, • Sodium Chloride • Distilled or deionized water • Stop Watch • Weighing Scale,	Corrosion Resistance Clause 4.3.2
2	• Heat –conditioning apparatus as per Clause 5.7.1, • Wet-spray-conditioning apparatus, as per Clause 5.7.3, • Cold –conditioning apparatus as per Clause 5.7.2, • Dust-conditioning apparatus as per Clause 5.7.4, • Apparatus for locking-reliability test as per Clause 5.8	Locking Performance after Conditioning Clause 4.3.3
3	• Apparatus for locking-reliability test as per Clause 5.8 • Steel Scale • Counter	Locking Reliability Clause 4.3.4
4	• Static strength test apparatus as per Clause 5.2 • Stop Watch	Retraction Capability Clause 4.3.5
5	• Test structure as per Clause 5.1. • Quick-release device as per Clause 5.3, • Test Mass as per clause 5.5, • Steel Scale or measuring Tape • Force Measuring Instrument as per Clause 5.4	Dynamic Performance with the lifeline at full Retraction Clause 4.3.6
6	• Test structure as per Clause 5.1. • Quick-release device as per Clause 5.3, • Test Mass as per clause 5.5, • Steel Scale or measuring Tape • Force Measuring Apparatus as per Clause 5.4	Dynamic Performance Clause 4.3.7
6	• Tensile Test Machine as per Clause 5.2 • Stop Watch • Steel Scale	Static Strength & Static strength (rescue facility engaged) Clause 4.3.8 & 4.4.4
7	• Static Testing Machine as per Cl. 6.2.1 of IS 3521 (Part 7) • Tripod • Test mass	SRL –Tripod installations Clause 4.3.9

8	• Test Structure as per Clause 5.1, • Test Masses as per Clause 5.5, • Steel Scale , • Stop Watch	Lifting & Lowering Clause 4.4.3
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The list above is indicative in nature and may not be taken as exhaustive

ANNEXURE-D

**SCHEME OF INSPECTION AND TESTING FOR
PERSONAL FALL ARREST SYSTEM PART 3 SELF RETRACTING LIFELINES
ACCORDING TO IS 3521 (PART 3) : 2021**

1. LABORATORY - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

1.1 The manufacturer shall prepare a calibration plan for the test equipment.

2. TEST RECORDS –The manufacturer shall maintain test records for the tests carried out to establish conformity.

3. PACKING AND MARKING – The Standard Mark, as given in the Schedule of the licence, shall be clearly and indelibly marked on each Self-retractable Lifeline, provided always that material to which this mark is thus applied, conform to every requirement of the specification.

3.1 Marking – Each Self-retractable Lifeline and their packaging shall be clearly and indelibly marked to give the information as per clause 7.2 of IS 3521 (Part 3). In addition, the following details shall be marked legibly and indelibly:

- a) BIS Licence No. CM/L..... and
- b) BIS website details i.e. – “For details of BIS certification please visit www.bis.gov.in” (in case of space constraints, may be marked only on the package).

3.2 Packing – The material shall be packed as per Cl. 7.3 of IS 3521 (Part 3).

3.3 Instructions for general use, marking, packaging and maintenance shall also be provided as per the provisions of the Indian Standard.

4. CONTROL UNIT – For the purpose of this scheme, Self-retractable Lifeline of the same Design/Variety manufactured from the same consignment of raw material in a day shall constitute one control unit.

5. LEVELS OF CONTROL - The tests as indicated in column 1 of Table 1 and the levels of control in column 3 of Table 1, shall be carried out on the whole production of the factory which is covered by this plan and appropriate records maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered by the licence should be marked with Standard Mark.

6. REJECTIONS–Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

TABLE 1
LEVELS OF CONTROL
(Para 5.0 of the Scheme of Inspection and Testing)

Test Details (1)				(2)	Levels of Control (3)		
Cl.	Requirement	Test Methods			No. of Samples	Frequency	Remarks
		Clause	Reference	Test equipment requirement R: Required (or) S: Sub Contracting permitted			
4.2.1	Fibre Ropes & Webbing						
4.2.1.1	Material	4.2.1.1	IS 3521 (Part 3) : 2021	S	All	Each Consignment	If ISI marked or accompanied by TC, no further testing is required
4.2.1.2	Fibre Rope	IS 4572/ IS 11066	IS 4572/ IS 11066	S	1 Sample		
4.2.1.3	Braided Rope	EN 892/EN 1891 Type A	EN 892/ EN 1891 Type A	S	1 Sample		
4.2.1.5	Breaking Strength	4.2.1.5	IS 3521 (part 3) : 2021	S	1 Sample		
4.2.1.4	Protective means	4.2.1.4	IS 3521 (part 3) : 2021	R	All	Each Control Unit	
4.2.2	Terminations						
4.2.3.1	Terminations	4.2.3.1	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	* If ISI marked no further testing is required
4.2.3.2	Eye Splices	4.2.3.2	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	
4.2.3.3	Stitched Eye terminations	4.2.3.3	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	
4.2.3.4	Eye terminations of wire rope lanyards	4.2.3.4	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	

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4.2.3.5	Selection of Swage	4.2.3.5	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	
4.2.3.6	Wire rope end	4.2.3.6	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	
4.2.3.7	Knots	4.2.3.7	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	
4.2.3.8	Internal Termination	4.2.3.8	IS 3521 (part 3) : 2021	R*	All	Each Control Unit	
4.2.4	Energy Absorber Integral to the Lifeline	4.2.4	IS 3521 (part 3) : 2021	R	All	Each Control Unit	
4.3	Design						
4.3.1.1	Working Parts	4.3.1.1	IS 3521 (part 3) : 2021	R	All	Each Control Unit	-
4.3.1.2	Finish	4.3.1.2	IS 3521 (part 3) : 2021	R	All	Each Control Unit	-
4.3.1.3	Automatic Locking	4.3.1.3	IS 3521 (part 3) : 2021	R	All	Each Control Unit	-
4.3.1.4	Attachment Points	4.3.1.4	IS 3521 (part 3) : 2021	R	All	Each Control Unit	-
4.3.1.5	Retraction	4.3.1.5	IS 3521 (part 3) : 2021	R	All	Each Control Unit	-
4.3.1.6	Lifeline wear	4.3.1.6	IS 3521 (part 3) : 2021	R	All	Each Control unit	-
4.3.2	Corrosion Resistance						
4.3.2.1 & 4.3.2.2	Corrosion	6.1	IS 3521 (part 3) : 2021	R	1 Sample of each variety	Each Control Unit/ Each consignment	-

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4.3.3	Locking Performance after Conditioning						
4.3.3.1	Locking After Heat Conditioning	6.2.3 & 6.2.8	IS 3521 (part 3) : 2021	R	1 Sample of each Variety	Each 7 th Control unit or every week whichever is earlier	-
4.3.3.2	Locking After Cold Conditioning	6.2.4 & 6.2.8	IS 3521 (part 3) : 2021	R	1 Sample of each Variety	Each 7 th Control unit or every week whichever is earlier	-
4.3.3.3	Locking after wet-spray conditioned	6.2.5 & 6.2.8	IS 3521 (part 3) : 2021	R	1 Sample of each variety	Each 7 th Control unit or every week whichever is earlier	-
4.3.3.4	Locking after Dust conditioning	6.2.6 & 6.2.8	IS 3521 (part 3) : 2021	R	1 Sample of each variety	Each 7 th Control unit or every week whichever is earlier	-
4.3.3.5	Locking after oil conditioing	6.2.7 & 6.2.8	IS 3521 (part 3) : 2021	R	1 Sample of each Variety	Each 7 th Control unit or every week whichever is earlier	-
4.3.4	Locking Reliability	6.3	IS 3521 (part 3) : 2021	R	1 Sample of each Variety	Each 7 th Control unit or every week whichever is earlier	-
4.3.5	Retraction Capability	6.4	IS 3521 (part 3) : 2021	R	1 Sample of each Variety	Each Control unit	-
4.3.6 4.3.6.1 4.3.6.2	Dynamic Performance with the lifeline at full retraction	6.5	IS 3521 (part 3) : 2021	R	1 Sample of each variety	Each Control unit	-
4.3.7 4.3.7.1 4.3.7.2	Dynamic Performance	6.6	IS 3521 (part 3) : 2021	R	1 Sample of each variety	Each Control unit	-
4.3.8	Static Strength	6.7	IS 3521 (part 3) : 2021	R	1 Sample of each Variety	Each Control unit	-
4.3.9	SRL-Tripod Installation	IS 3521 (Part 7)	IS 3521 (part 7) : 2021	R	1 Sample of each Variety	Each Control unit	If applicable
4.4	Integral Rescue Facility Design						
4.4.1	General						

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4.4.1.1 & 4.4.1.2	Requirements	4.4.4.2 & 4.3	IS 3521 (part 3):2021	R	1 Sample of each variety for each test	Each Control unit	-
4.4.1.3	Controlling means	4.4.1.3	IS 3521 (part 3):2021	R	All	Each Control unit	-
4.4.2 4.4.2.1 4.4.2.2	Engagement of rescue facility	4.4.2.1 & 4.4.2.2	IS 3521 (part 3):2021	R	All	Each Control Unit	-
4.4.3	Lifting & lowering	6.8 or 6.9	IS 3521 (part 3):2021	R	1 Sample of each variety	Each Control unit	-
4.4.4	Static Strength (rescue Facility engaged)	6.10	IS 3521 (part 3):2021	R	1 Sample of each variety	Each Control unit	-

Note 1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau.

Note 2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification to BO head.

Note-3: Each consignment of material, used in manufacture of Self Retractable lifeline has to be accompanied with supplier's test certificate or test report issued by a third party laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau or In house factory testing to be done. No testing is required if the material is ISI marked.